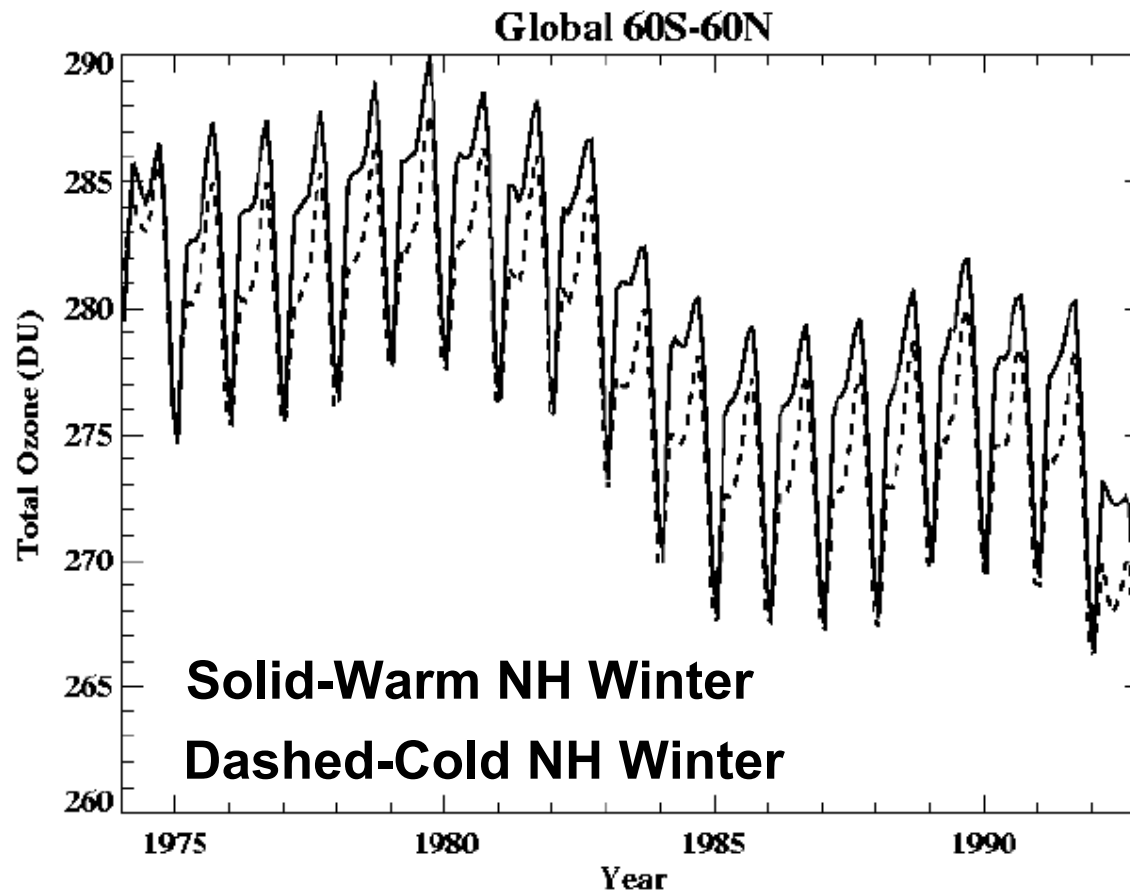


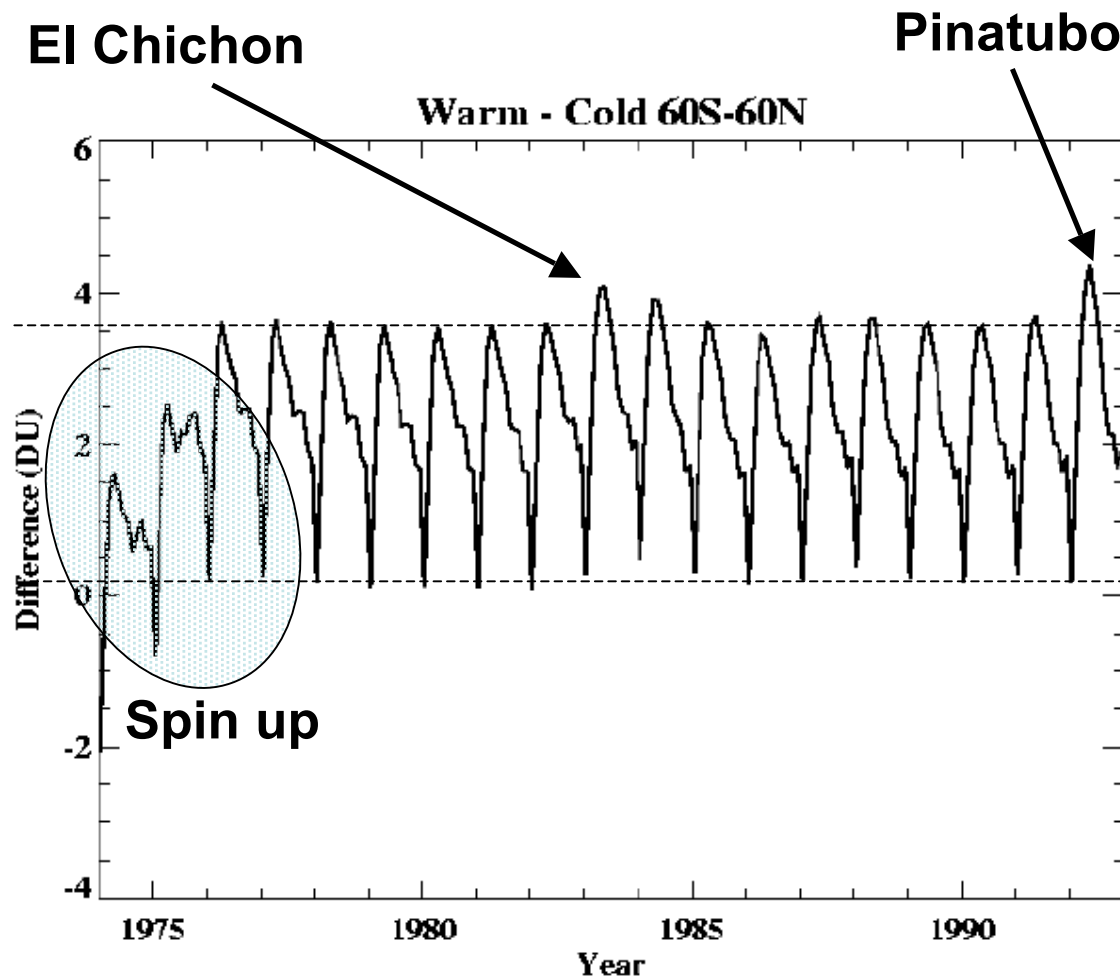
# **GMI Stratospheric Hindcasts**

- **Hindcast/forecast 1973-2025**
- **Warm NH winter from FVGCM (2024)**
- **Cold NH winter from FVGCM (1993)**
- **Full chemistry of stratosphere**
- **Chlorine/bromine change, aerosol surface area including volcanos, solar cycle uv variaiton**

# Comparison of warmcast to coldcast



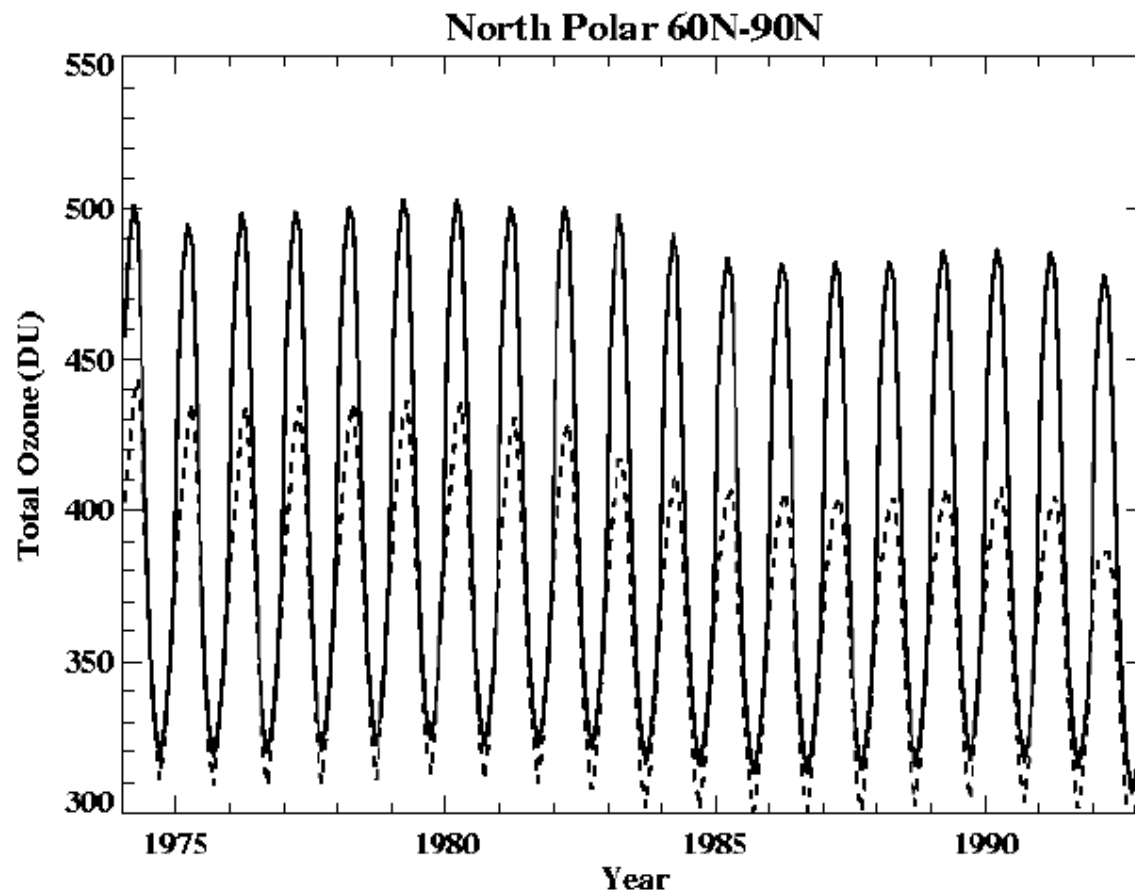
# Difference (warm - cold) 60S-60N Average



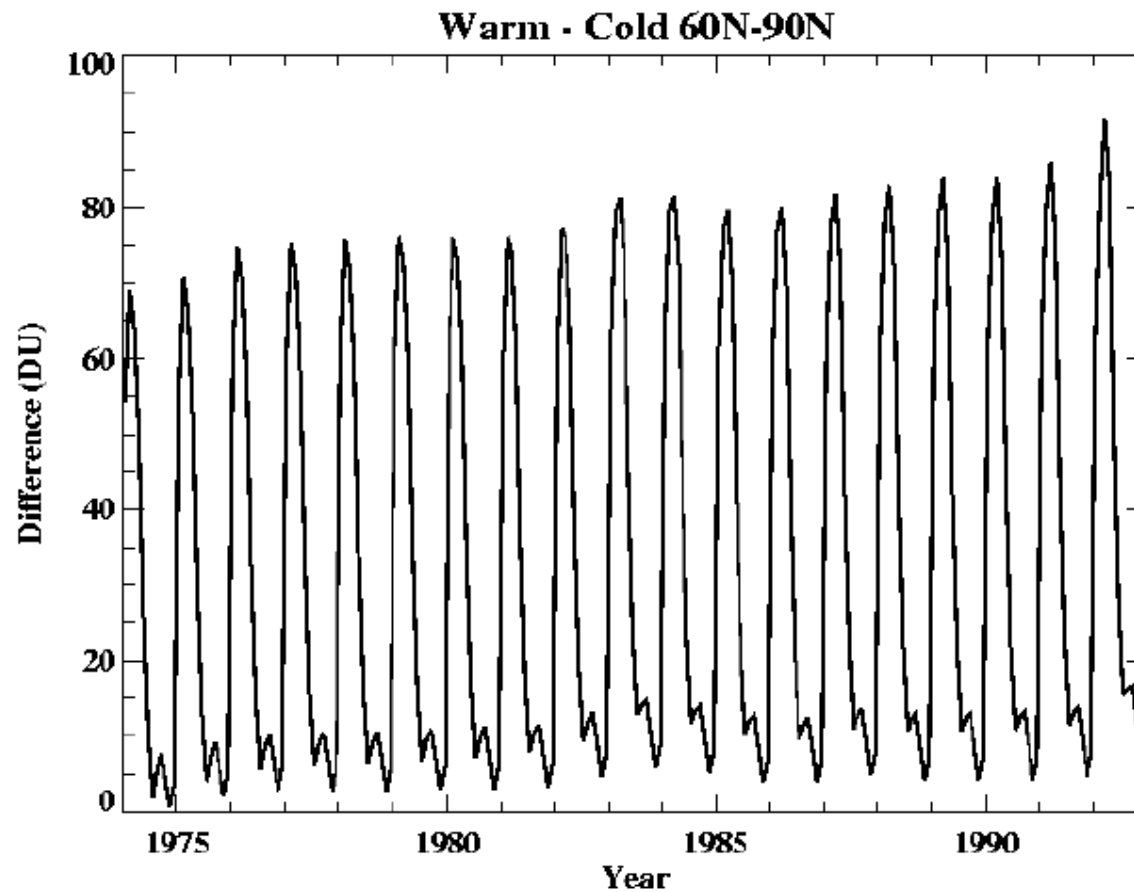
Less depletion  
due to volcanos  
In warm case

Otherwise, no  
Trend and no  
Solar cycle in  
Difference at  
Max or min

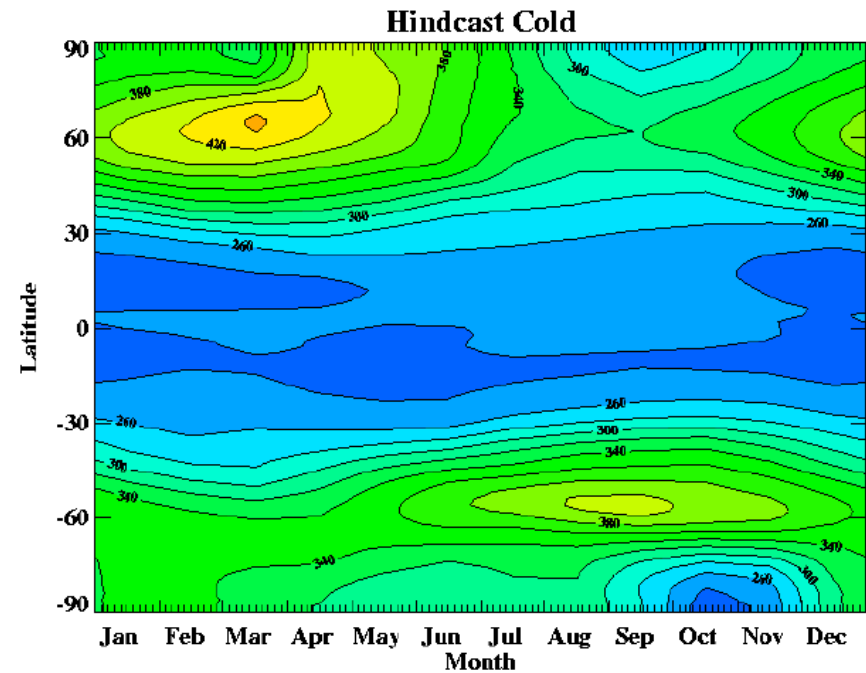
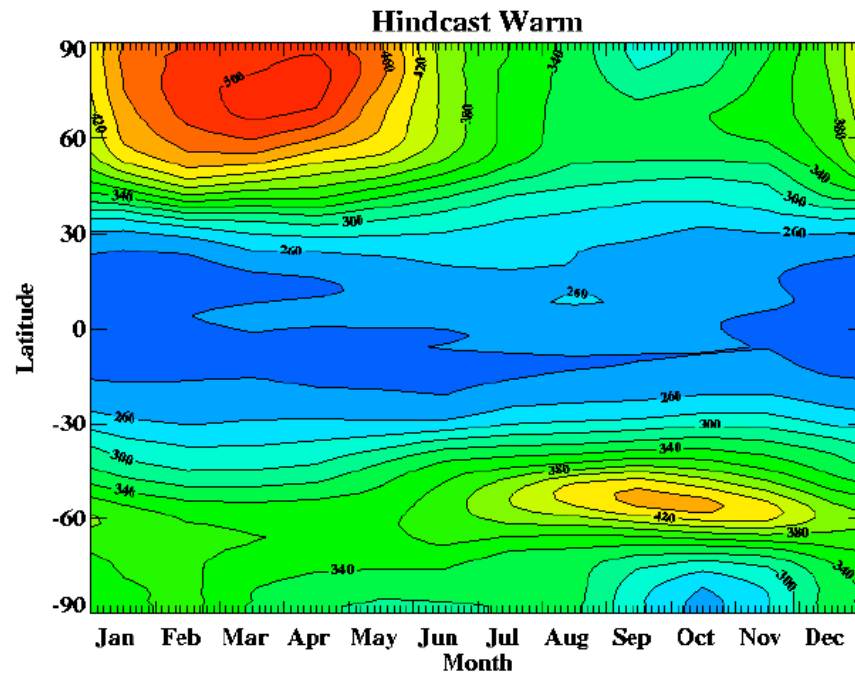
# North Polar Comparison of Warm and Cold Hindcasts



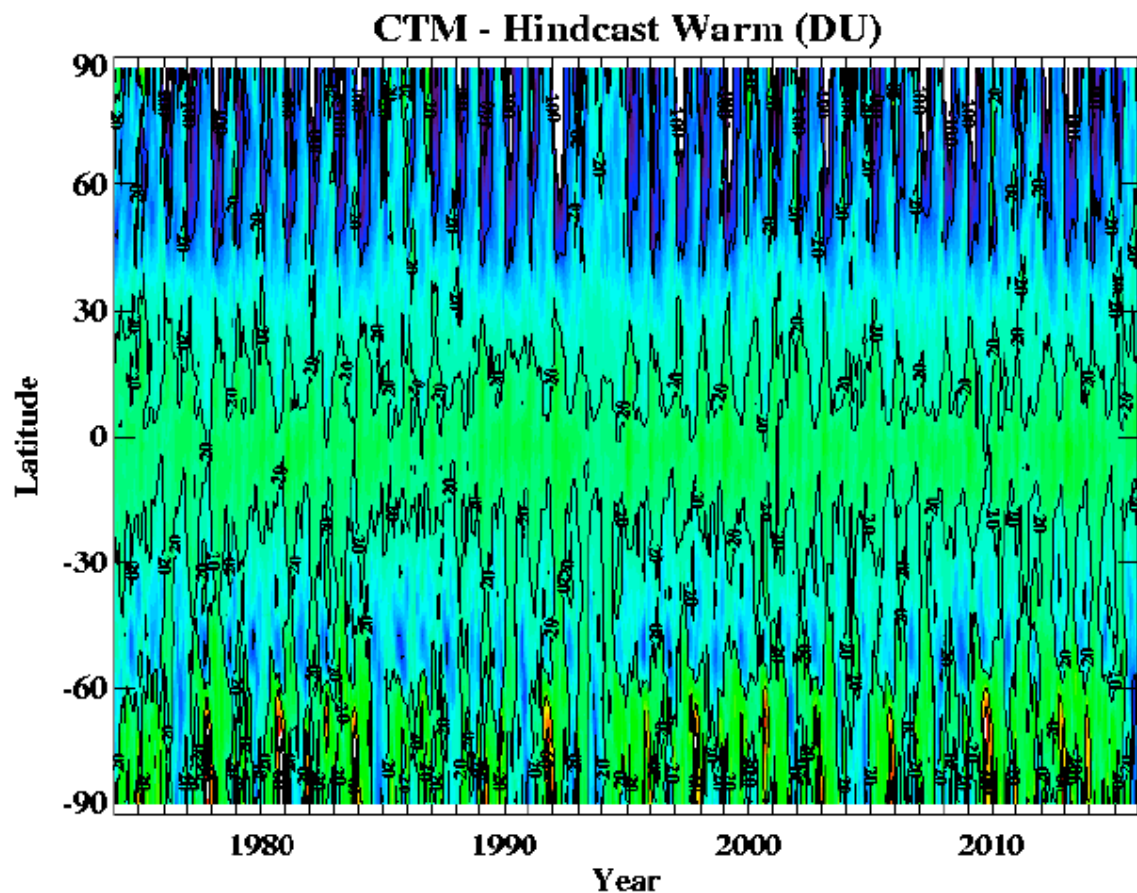
# North Polar Comparison of Warm and Cold Hindcasts



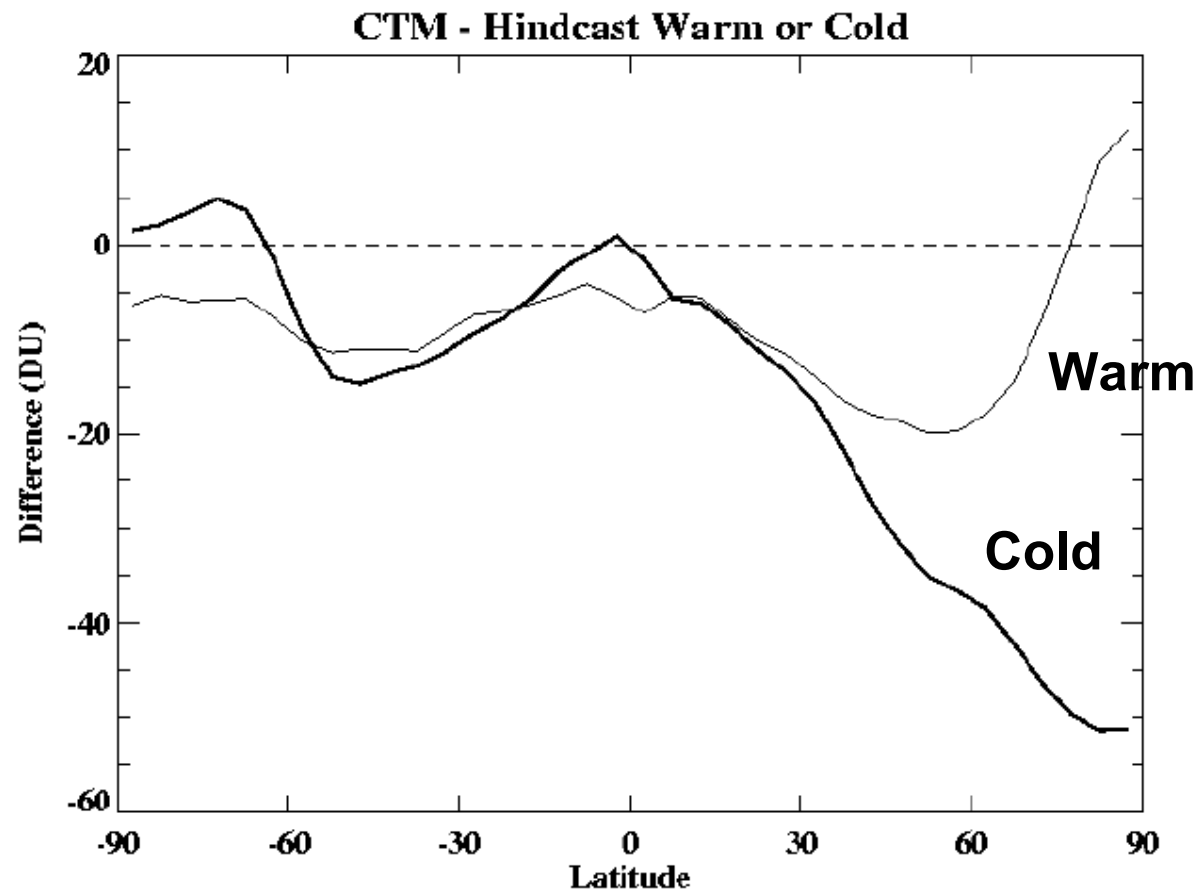
# Season/Latitude Comparison



# Comparison of Coldcast to CTM with Interannual Variability in Dynamics



# Comparison to CTM with Interannual Variability in Dynamics





# Time Series Analysis Results

Term	Hindcold	Hindwarm	50-year CTM
Mean (DU)	277.6	274.9	263.1
Annual Mag (DU)	2.69	3.54	2.38
Semi-Annual Mag (DU)	2.15	2.84	2.13
Mean Trend (DU/Decade)	-7.6	-7.0	-6.7
Solar DU/100 units F10.7	3.7	3.2	4.1
El Chichon (DU)	-1.3	-1.5	-2.2
Pinatubo (DU)	-5.0	-5.5	-4.8